THE EFFECT OF MEDIAL TAPING OF PATELLA IN CHRONIC PRIMARY OSTEOARTHRITIS OF THE KNEE WITH PATELLOFEMORAL INVOLVEMENT

By

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PADMAVATH COLLEGE OF PHYSIOTHERAPY

PERIYANAHALLI

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Under the guidance of

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Submitted in Partial fulfillment of the requirements for the

Degree of **Master of Physiotherapy**

From

The Tamilnadu Dr. M.G.R. Medical University,

Chennai

PADMAVATH COLLEGE OF PHYSIOTHERAPY

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CERTIFICATE

This is to certify that the project entitled **"THE EFFECT OF MEDIAL TAPING OF PATELLA IN CHRONIC PRIMARY OSTEOARTHRITIS OF THE KNEE WITH PATELLOFEMORAL INVOLVEMENT"**

Submitted by the candidate

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is a bonafide work done in partial fulfillment of the requirements for the Degree of **Master of Physiotherapy** from

The Tamilnadu Dr. M.G.R. Medical University,

Chennai

Guide **Principal**

Viva-voce Examination held on _____

Internal Examiner **External Examiner**

DECLARATION

I hereby declare and present my dissertation entitled entitled **"THE EFFECT OF MEDIAL TAPING OF PATELLA IN CHRONIC PRIMARY OSTEOARTHRITIS OF THE KNEE WITH PATELLOFEMORAL INVOLVEMENT"** the outcome of the original research work undertaken and carried out be me , under the guidance of **Mr. K. KUMAR , M.P.T. , MIAP.,** Associate Professor , Padmavathi College of Physiotherapy, Periyanahalli, Dharmapuri , Tamilnadu.

I also declare that the material of this dissertation had not formed in any basis for the award of any other Degree previously from the Tamilnadu Dr. M.G.R. Medical University, Chennai.

(JUBIN THOMAS)

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(JUBIN THOMAS)

DEDICATED TO MY BELOVED

PARENTS , STAFFS

AND

LOVABLE FRIENDS

TABLE OF CONTENTS

INTRODUCTION

Osteoarthritis is a common problem for many people after middle age,Osteoarthritis is sometimes reffered to as degenerative or wear and tear arthritis.Osteoarthritis may result from an injury to the knee earlier in life. Fractures Involving the joints surface,instability from ligament tears , and meniscal injuries can all cause abnormal wear and tear of the knee joint.Not all cases of steoarthritis are related to prior injury,however research has shown that some people are prone to develop osteoarthritis and this tendency may be genetic.

The main problem in osteoarthritis is degeneration of the articular cartilagethat covers the joint mainly the patellofemoral joint. Features of patellofemoral joint arthritis includes malalignment and maltracking of the patellaa. Patellofemoral arthritis is the second most common musculiskeletal complaint presented to physiotherapist. Since osteoarthritis affects the elderly more than any other age group. The Increase in the number of elderly individuals can contribute to a significant Increase by the year 2020. Simple inexpensive treatment is needed for common disorders such as knee osteoarthritis, which is not life threatening but can cause years of pain and handicap for a large number of people in the community. Inexpensive interventions that give

patients some control over their symptoms are particularly attractive. If effective, they could reduce the financial burden of these patients as well as improving their quality of life.

Recent reports have emphasized the importance of the patellofemoral Compartment. In knee osteoarthritis, disease of this part of the joint can cause Pain, particularly when the patient is using stairs, squatting or kneeling. Malalignment of patella with consequential abnormal force diatribution on the Lateral facet,is thought to be the cause of these symptoms.Taping the patella to

Pull it medially followed by quadriceps exercises may provide simple therapeutic

Measure.

Therefore the purpose of this study is trying to find out the effect of medial Taping of the patella in chronic primary osteoarthritis of the knee with patellofemoral involvement along with standardized treatment thereby providing a Tremendous decrease in pain and providing a near normal functioning knee for the Well being of the patient

REVIEW OF LITERATURE

2.1 Historical record

(Peyron and altman,1973)

British studies showed that 2.3% of men and 1.3% of women in the work Force had to retire because of osteoarthritis;a loss of 4.7 million working days in 1974.Radiologically it is evident in 80% of individuals aged 55 years and older.

2.2 Paleopathological record

Next to traumatic conditions arthritis is the oldest and most widespread Pathological conditions reported in paleopathology.First recognized in Dinosaurus, Arthritis has been continuous throughout history.In hominidis,chronic arthritis has been observed from the time of Neanderthal man.(eg., the man of La Chapelle- aux-Saints).Studies of skeleton from the Saxon and Roman period of early England have shown changes consistent with osteoarthritis in at least half the

Specimens.

2.3 Epidemiology

(Antoine Helewa,1996)

Epidemiologic surveys show a strong association between osteoarthritis and wear and tear,prolonged immobilization,continuous pressure,impact loading anatomic abnormalities and previous inflammatory joint injury.No association was found between long-distance running and clinical evidence of osteoarthritis in the lower extremities.There is a suggestion in the literature that body weight is positively associated with osteoarthritis of knee, however a cause and effect relationship between osteoarthritis and obesity has not clearly identified.

2.4 Prevalence

(Joan M.Walker, 1996)

Prevalence varies from 4% among those aged 18-24 years to 85% among those Aged 75-79 years with an average of 37% overall.

(Joan M.Walker ,1996)

It is more frequent in men below the age of 54 years but the sex ratio is reversed thereafter.Moderate or severe involvement is more prevalent in women than men by 6% after adjusting for age.No racial or urban-rural differences was found.

2.5 Pathogenisis of osteoarthritis

(InstallJ, Falvo,KA and wise DW,1976)

Cartilage changes on the medial patellar facet of patellofemoral joint is More common,but changes found on the lateral facet will more commonly Progress to osteoarthritis.

(Freeman,1975,Maroudas,1976)

As the articular surfaces become increasingly malposed and the joint Unstable,cartilage at the edge of the joint reverts to the more youthful activities of Growth and osteophytes formation.

2.6 Biomechanics of patellofemoral joint

(Liet FJ,Perry J,1968)

They studued the position of the patella in the fully extended or neutral knee and found that it lies on the femoral sulcus which is related to the length of the patellar tendon.

(Ficat)

The transverse and longitudinal structures influences the lateral stability of the patella and its position in femoral sulcus and patellar tracking or path of the patella as it slides down the femoral condyles within the intercondylar notch is maintained.

(Kaplan,1962)

The pull of the quadriceps and the pull of the patellar ligament lie at a slight angle to each other producing a slight lateral force on the patella and hence increase the compression on the lateral facets as it pushes harder in to the lateral lip of the femoral sulcus (in knee extention) or the lateral aspect of the intercondylar notch(in knee flexion).

(Goodfellow JW,Hungerford DS,Woods C,1976)

Failure of the patella to slide,tilt or rotate appropriately according to knee rotation,can lead to restriction in knee joint range of motion,to instability of the patellofemoral joint or to pain caused by erosion of the patellofemoral surfaces.

(Hungerford DS,Barry M,1979)

The increased knee flexion and quadriceps muscle activity seen with stair Climbing or running hills may increase the patellofemoral joint reaction force to 3.3 times body weight at 60 degree of flexion.The joint reaction force may reach 7.8 Times the body weight at 130 of knee flexion in such activities as deep knee bends When knee flexion is extreme and a strong quadriceps contraction is required.This Produces joint compression on the patellofemoral joint in general and on the Medial facet specifically.

2.7 Diagnosis of osteoarthritis

(Dieppe and Rogers)

Making a diagnosis of osteoarthritis solely on evidence of osteophytes,since These alone may reflect aging changes.

2.8 Physiotherapy management

2.8.1 Effect of prehistoric management

(Palmer,1942)

Use of effleurage,kneading and petrissage in treatment of osteoarthritis was done but noted that frictions should be avoided on the articular margins of joint,as they may cause pain and irritation.Movements should be active and performed within the limit of pain.

(Tidy)

Use of evaporative lotions such as lead lotion or lead or opium lotion, faradism,radiant heat and whirpool baths.Forced movements were not advised However manipulation wsa recommended if stiffness did not respond to traditional therapy.Massage was also recommended.

2.8.2 Effects of heat therapy

(Kalber Moflet JA,et al,1996)

The effectiveness of pulse shortwave in the relisf of pain in osteoarthritis of knee in 92 patients to one of 3 treatment control group showed patients who were given placebo application tend to report more benefit than active treatmemt 9 sessions of treatment was provided over a 3 weeks period,each application lasting for 15 minutes.

(Quick,et al,1985)

A combination of heat therapy with that of quadriceps exercises in treatment of patellofemoral arthritis is proved beneficial.

(Chamberlain,et al,1982)

Comparison of continuous short wave diathermy plus exercise,with exercise alone was done and found both equally effective in relieving symptomps. Four weeks after treatment,however, the effect was only maintained at 12 weeks in those who continued exercises,suggesting that exercise may have been the effective intervention.He concluded that,trials are needed which seprates the exercise element from the heat element.

(Hamilton DE,et al,1959)

Treatment of patellofemoral arthritis with short wave diathermy given for 20 minutes,3 times a week,infrared radiation for 20 minutes,3 times a week; faradism to quadriceps for 20 minutes 3 times a week and untuned short wave diathermy for the same time over 5 months.

2.8.3 Effects of exercise

(Exercise and sports science,1981)

Hamstring and iliotibial band stretching done for 5 times and holding for 20 seconds is beneficial in patients with patellofemoral arthritis.

(Deusinger RH,1984)

During the acute stage of inflammation isometric exercise is well accepted because of low increase in intra- articular pressure and minimal joint movement involved.

(Vas Eijden,et al,1983)

Isometric exercise produces a greater amount of tension in the muscle than do concentric contraction.

(Hislop HJ,1963)

2/3 of maximal contraction maintained for 6 second performed daily Increases strength in healthy males.

(Fleck S,Kraemer W,1987)

Isometric exercise can bring about increase in muscle hypertrophy and Neural adaptation,leading to strength gain.

(Fisher NM,Pedergast DR,1991)

They demonstrated in a series of elegant papers that patients with osteoarthritis of the knee have diminished muscle strength.They subsequently demonstrated that in a specially designed machine ,multiple-angle isometric exercise increased muscle strength, improved ability to perform ADL and decreased the use of analgesis.

(Bruce H,Greenfield,1993)

As a general guide line, strengthening should be initiated at sub-maximal level and slowly increased to maximal effort as joint effusion and inflammation resolve.

(Fox E,Mathews D,1981)

If adaptive changes in muscle, such as increase in strength and endurances are to occur, isometric contraction should be held against resistance for 6 seconds. This allows time for peak tension to develop and metabolic changes to occur in the muscles with each contraction.

2.8.4 Effect of cryotherapy

(Peter E.Wells,Bruce HG,et al,1993)

When ice is placed on the patient's skin,dramatic and immediate cooling occurs in the superficial tissuses which experience a drop in temperature of 15 deg C in 2-5 minutes.Ice reduces pain,muscle spasm thereby increasing range of motion.

2.8.5 Effects of T.E.N.S

(Angela and Nigel,1992)

T.E.N.S has been used extensively to alleviate both acute and chronic pain, muscle contraction can be obtained between 12 and 30 Ma.

(Lewise,et al,1988)

Reported in conclusive results for the trail of self administrated and placebo T.E.N.S for 30 patients with osteoarthritis of knee.

2.8.6 Effect of medial taping

(Larsen,et al,1995)

The issue for a therapist is not whether the tape changes the patellar positions on x-rays,but whether the therapist can decrease the patients symptoms by at least 50% so that the patient can exercise and train in a pain –free manner.

(Timothy, el al)

Knee taping reduces pain during exercise while the exercise strengthens the muscles and tendons that stabilize the knee cap.Taping the knee is meant as a temporary solution to knee pain and should never replace the exercise that corrects the cause of pain.

(Larsen,et al,1994)

The medial tape seems to prevent the lateral shift of the patella that occurred with exercise.

(Merianne Bigler,SPT)

Medial taping is often utilized in the treatment of patellofemoral pain with the intent to shift the patella into a more optimal position of biomechanical alignment.

(Bockrath,el al)

Determined that there were no significant changes in patellofemoral congruency angles or patellar rotation following patellar taping .However,they did report a significant decrease in perceived pain following the taping,as indicated by Visual Analog Scale.

(Cushnagen,et al,1994)

Found a 25% reduction in knee pain in elderly osteoarthritis group as a result of medial patellar taping compared to neutral or lateral taping.

(Bockrath K,et al,Werner S,et al,1993)

Taping often helps to relieve the patients discomfort and allows them to perform exercisee with greater intentions.

(Shellok,et al)

They have succeeded in showing that tracking anomalies occur at various positions in patella femoral ranges of motion by utilizing loaded kinematic MRI. Their study revealed that patellofemoral malalingment could be decreased with a patellar realingnment brace,as measured with kinematic MRI.

(Wooden,et al)

Decrease in pain associated with taping can lead to more effective quadriceps contraction thus improving funcitional outcome measure.

(Mc Connell,1986)

The predominant theory behind the use of Mc Connell taping is that its application shifts the patella to a more appropriate alignment,thus allowing proper biomechanics and reconditioning of musculature.

(Spencer et al,1984,Stroke et al,1984)

The patient should never train with or through pain or effusion, as it has been shown quite conclusively in literature that effusion has an inhibitory effect on muscle activity.Hence it has been fairly well established that medial taping of patella relieves pain by 50%.

MATERIALS AND METHODOLOGY

MATERIALS AND METHODS

3.1 Aim

To find out the effect of medial taping over patella in reducing pain as measured by VAS and improving functional abilities of patients as measured by Patellofemoral Joint Evaluation Scale in chronic primary osteoarthritis of knee with patellofemoral involvement.

3.2 Objectives

a) To find out the effect of medial taping in reducing pain as measured by VAS in patients with chronic primary osteoarthritis of knee with patellofemoral involvement.

b) To find out the effect of medial taping in improving funcitional abilities as measured by Patellofemoral Joint Evaluation Scale in patients with chronic primary osteoarthritis of knee with patellofemoral involvement.

c) To find out the effect of short wave diathermy and quadriceps isometric exercise to reduce pain and improving functional abilities in patients with chronic primary osteoarthritis of knee with patellofemoral involvement.

d) To compare the effect of medial taping over short wave diathermy and isometric exercise in reducing pain and improving functional abilities in patients with chronic primary osteoarthritis of knee with patellofemoral involvement.

3.3 Hypothesis

a) Null hypothesis

Medial taping over patella in chronic primary osteoarthritis of knee with patellofemoral involvement has no significant difference in reducing pain as measured by VAS and improving functional abilities as measured by Ptellofemoral Joint Evaluation Scale over short wave diathermy and isometric exercise.

b) Alternate hypothesis

Medial taping over patella in chronic primary osteoarthritis of knee with patellofemoral involvement has significant difference in reducing pain as measured by VAS and improving functional abilities as measured by Patellofemoral Joint Evaluation Scale over short wave diathermy and isometric exercises.

3.4 Study Design

It is an experimental study of pretest and post test

a) Population studies

Thirty patients attending a hospital who fulfilled entry criteria were recruited for the study. Patients reffered by ortho surgeon of Jacob memorial hospital ,pathanamthitta and those who fulfil entry criteria were considered for the study. The age of samples studied ranged from 55-65 years and who had knee symptoms with duration ranging from 1-3 years.

b) Inclusion criteria

1) 30 patients with chronic primary osteoarthritis of knee with patellofemoral involvement refered by ortho surgeon of Jacob Memorial Hospital,Pthanamthitta.

2) Age limit between 50 to 65 years

3) Both male and female.

4) Unilateral knee.

5) Rdiological changes in the knee typical of chronic primary osteoarthritis with involvement of patellofemoral joint with no deformity.

6) Negative screen for rheumatoid factor.

7) Pain predominantly emerging only from knee.

8) Patients with current radiographs of knee to find out disease severity and compartmental involvement.

c) Exclusion criteria

1) Age less than 50 years and more than 65 years.

2) Bilateral osteoarthritis of knee.

3) Secondary osteoarthritis of knee.

4) Patients with primary chronic osteoarthritis of tibiofemoral joint.

5) Arthritis of other cause such as septic arthritis, psoriatic arthritis ,gouty arthritis, SLE.

6) Muscle imbalance.

7) Excessive subtallar joint pronation.

8) Patella alta.

9) Position of femur i.e., anteversion or retroversion.

10) Patients with any systemic disease.

11) Peripheral vascular disease.

12) Hip or spinal disorders causing pain in or around the knee.

13) Any neurological involvement or disorder which may interfere with the treatment.

14) Post surgical conditions.

15) Metals in or around knee.

16) Congenital wasting of muscle around the knee.

17) Recent trauma.

d) Sampling method

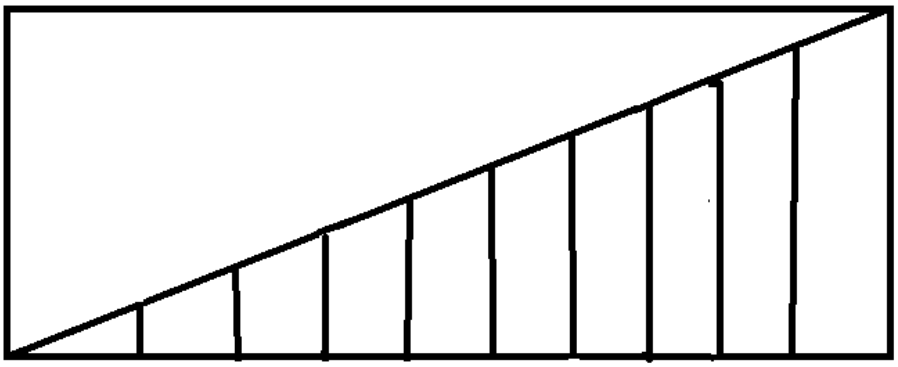
subjects are chosen based on convenience sampling method.30 subjects are divided into experimental group and control group with 15 subjects in each group.

3.5 Measurement tools

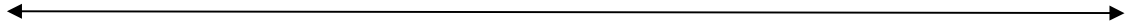
Visual analog scale, patellofemoral joint Evaluation scale , goniometer , inch tape.

3.6 outcome measures

a) visual analog scale (VAS) for pain



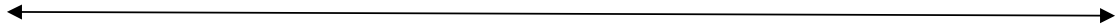
If the patient place' X' in the left hand end of the line .There is no pain.



No pain

Extreme pain

If the patient place ‘X’ in the right hand end of the line. Then the patient is indicating that the pain is extreme.



No pain

Extreme pain

b) patello femoral joint Evaluation scale for functional assessment

It consist of assessment of limping, assistive devices , stair climbing, crepitation, inability, giving – way , swelling pain , and has a definite scoring system.Functional results were assessed according to the patella femoral scoring scale.Excellent results equals 90-100 ponits, good 80-89, fair 60-79 and poor < 60 points.

3.7 Materials used

Non elastic white tape, Leucoplast , Micropore , Scissors, cotton swabs , disposable shaving set , cleansing agent , 4 towels , straps ,

recording sheets and follow up chart, consent form and other stationery materials.

3.8 The experimental group

15 patients satisfying the criteria were included in this group. This group received

short wave diathermy , isometric quadriceps exercise and also medial taping of patella for a

period of 7 days.

Procedure

a) Short wave diathermy

- Position

  Lying with contraplanar pad placement over the knee.

- Frequency

  50 watts machine.

- Duration

  15 minutes

- Sittings

  7 days of treatment including 1 sitting /day.

b) Isometric quadriceps exercise

Supine lying , ask the patient to hold the patella in cephalic position for 10 seconds and then relax. The contraction is carried out for 10 repetitions with rest in between. A total of 50-75 contractions is usually done.

c) Medial taping procedure

Position the patient in relaxed, supported long sitting with the knee aligned in a neutral position. The area of the knee to be taped is shaved and made clean. A 2.5 cm wide and 20 cm long non-elastic white tape is secured at the lateral border of the patella and pulled medially. Soft tissue is taken up at the medial aspect of the thigh and then the tape is secured along the medial border of femoral condyle. The knee cap is taped every day for a period of 1week. There are two types of tapes that are applied to the patient's knee .The first tape applied is a white protective tape (micropore), which is meant to provide a firm surface for the more adhesive tape .The adhesive tape should not be applied directly to the skin. The white tape adheres to a smoothly shaven and non-oiled skin surface. If the skin becomes irritated by the tape, the patient should remove the tape and treat the skin with topical ointment.

To assess the effect of taping ,a pain provoking activity such as a single or double squat is performed immediately prior to taping and repeated afterwards .If the tape is applied correctly the post taping squat will be painless.

d) Home exercises

- Quadriceps sets
- Straight leg raising
- Lying ; one hip and knee bending, knee stretching and leg lowering
- High sitting, knee stretching.

3.9 The control group

The control group received the same treatment as that of experimental group except medial taping procedure. Visual analog scale for pain and functional disability using patellofemoral joint evaluation scale was taken at the first day and on the 7^{th} of the treatment in both the groups.

3.10 Statistical tests used

The statistical tests used in this study includes student' t' test and both paired and unpaired' t' test.

Student 't' test

a) Paired t test is applied on the initial values of experimental and control groups and then on final values of experimental and control group to find out that the two independent group samples were selected from the same population and thereby to make the result obtained accepted.

$$t = \frac{\not{d}}{SD} \times \sqrt{n}$$

$$SD = \sqrt{\frac{\Sigma d^2 - n\bar{d}^2}{n-1}}$$

Where

n = number of patients

SD = standard deviation

$\bar{d}$ = Mean of the difference between pre and post treatment values

d = the difference between pre and post treatment values.

b) For analysing experimental group's response over the control group's response, i.e., for finding out the significance of biofeedback in increasing active and passive flexion ranges of movement at knee in post-arthroscopic partial synovectomy patients, unpaired 't' test is used. The formula used is

$$t = \frac{\bar{X}_1 - \bar{X}_2}{S}\sqrt{\frac{n_1 n_2}{n_1 + n_2}}$$

$$S = \sqrt{\frac{(n_1 - 1)\mathbf{s}_1^2 + (n_2 - 1)\mathbf{s}_2^2}{n_1 + n_2 - 2}}$$

$$S_1 = \sqrt{\frac{\Sigma x_1^2 - n_1\left(\bar{x}_1\right)^2}{n_1 - 1}}$$

$$S_2 = \sqrt{\frac{\Sigma x_2^2 - n_2\left(\bar{x}_2\right)^2}{n_2 - 1}}$$

Where ,

$\sum x_1^2$ = The square of each individual difference between pre-test and post-test values of experimental group totalled.

$\sum x_2^2$ =The square of each individual difference between pre-test and post-test values of control group totalled.

X_1 = Mean of the difference between pre-test and post-test values of experimental group.

X_2 = Mean of the difference between pre-test and post-test values of control group.

$(\sum x_1)^2$ =The total of the individual difference between pre-test and post-test values of experimental group squared.

$(\sum x_2)^2$ = The total of the individual difference between pre-test and post-test values of control group squared .

n_1 = Number of samples in experimental group.

n_2 = Number of samples in control group.

S_1 = Standard deviation of experimental group.

S_2 = Standard deviation of control group.

S = the common standard deviation.

RESULTS & ANALYSIS

RESULTS AND ANALYSIS

4.1 Demographic representation of data

4.1.1 Table I

Variable		Number of patients in experimental group	Number of patients in control group
AGE	50-55yrs 55-60yrs 60-65yrs	2 4 9	5 6 4
SEX	MALE FEMALE	6 9	7 8
SIDE	RIGHT LEFT	11 4	9 6

Table shows distribution of age, sex and side in experimental and control group.

4.1.2 Diagram I (a)

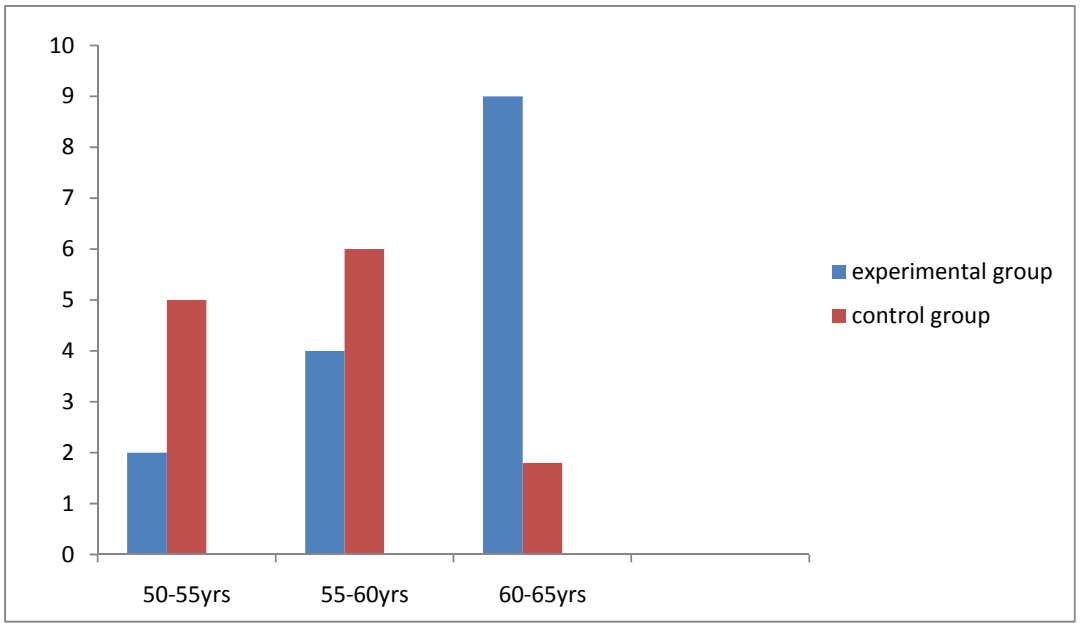


Diagram shows the distribution of age class intervals between experimental and control group.

4.1.2 Diagram 1 (b)

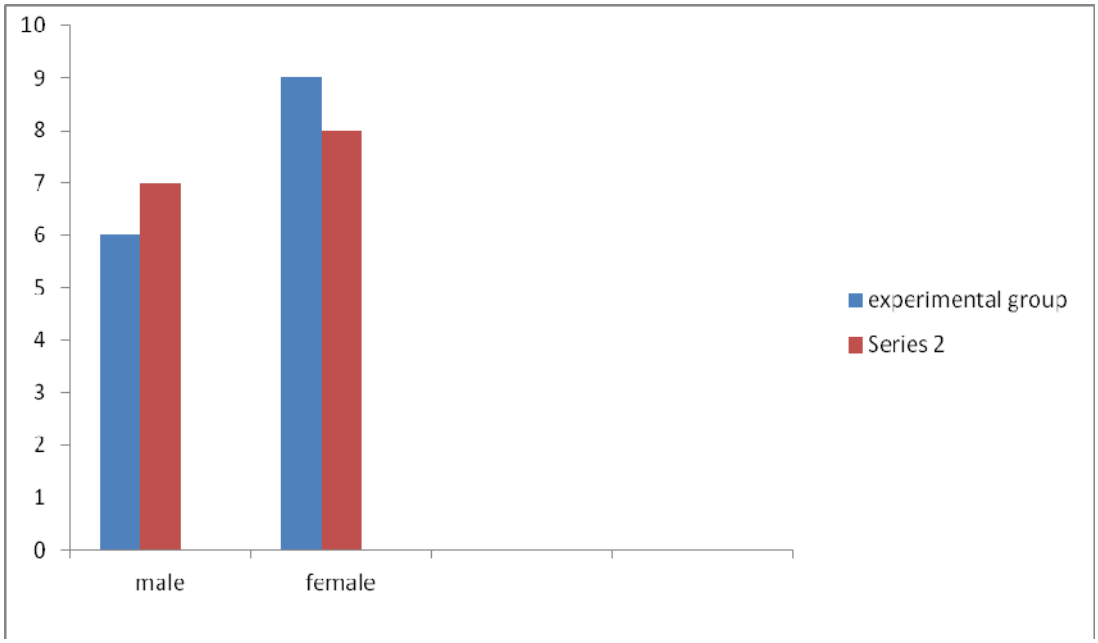


Diagram shows the distribution of subjects in gender variation in patellofemoral arthritis.

4.1.2 Diagram 1(c)

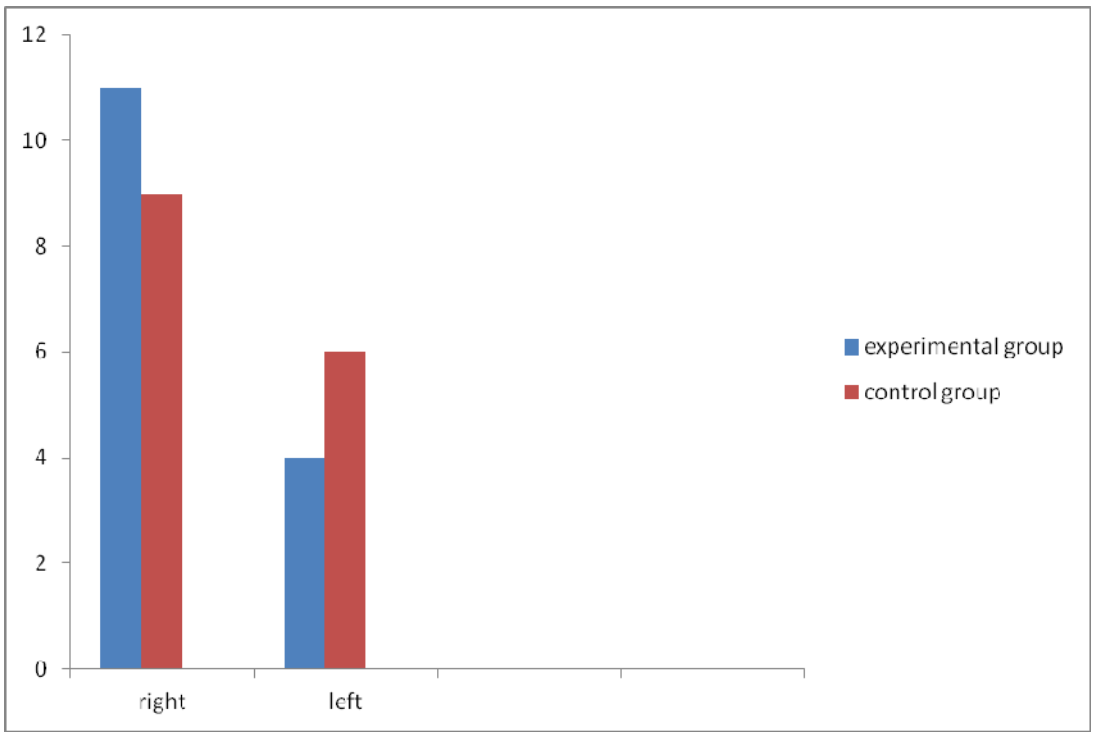


Diagram shows the distribution of side variation in patellofemoral arthritis

4.1.3 Demographic Analysis of data

1. Using Extended Chi-square test

A. Comparing the number of individuals in age class intervals between experimental and control group.

- Calculated Extended Chi-squared value (0.63) is less than the critical value (7.82) at 5% level of significance, showing that there is no significant difference in number of individuals of different ages between experimental and control group.

2. Using Chi-squared test

A. Comparing the number of individuals in sex variation between experimental and control group.

- Calculated Chi-squared value (0.54) is less than the critical value (3.84) at 5% level of significance showing that there is no significant difference in the number of individuals sex variation between experimental and control group.

B. Comparing the number of individuals in side variation between experimental and control group.

- Caculated Chi-squraed value (0.01) is less than the critical value (3.84) at 5% level of significance, showing that there is no significant difference in the number of individuals is side variation between experimental and control group.

VAS

4.2.3 Analysis of results

1. Independent t test

A. Comparing the pretest values of experimental and control groups.

- Pretest mean values of experimental group is 6.78 and control group is 6.32.
- Calculated t value (0.872) is less than the table value (t= 2.048) at 5% level of significance for two- tailed test, showing that there is no significant difference between the two groups.

B. Comparing the post test values of experimental and control groups

- Post test mean values of experimental group is 5.86 and control group is 4.7
- Calculated t value (2.471) is greater than the table value (t= 2.048) at 5% level of significance for two tailed test , showing that there is significant difference between the two groups.

C. Comparing the mean of difference between the pretest and post test values of experimental and control groups.

- Mean of the differences (d) between the pretest and post test values of experimental group is 2.07 and that of control groups i.e.,0.45.
- Calculated t value (5.84) is greater than thae t value (t=2.048) at 5% level of significance for two –tailed test, showing that there is significant difference between the two groups. So, the null hypothesis is rejected.

2. Dependent test

A. Comparing the initial and day 7 values of experimental group.

- Mean pretest value is 6.78 and post test value is 4.7.
- Calculated t value (7.70) is greater than the table value (t= 2.145) at 5% level of significance for two –tailed test , showing that there is significant difference between the two values.

3. Percentage of difference

Percentage reduction of VAS score from initial value is experimental group is 20% and control is 4.6%. When comparing the percentage difference in reduction of VAS between experimental and control group , there is better reduction of pain in experimental group at the end of treatment.

Patellofemoral Joint Evaluation Scale

4.3.3 Analysis of result

1. Independent t test

A. Comparing the pretest values of experimental and control groups.

- Pretest mean values of experimental group is 50.26 and control group is 52.8.
- Calculated t values (0.55) is less than the table values (t =2.048) at 5% level of significance for two-tailed test, showing that there is no significant difference between the two groups.

B . Comparing the post test values of experimental and control groups.

- Post test mean value of experimental group is 70.66 and control group is 62.86.
- Calculated t value (2.26) is greater than the table value (t =2.048) at 5% level of significance for two –tailed test, showing that there is significant difference between the two groups.

C. Comparing the mean of the differences (a) between the pretest and post test values of experimental and control groups.

- Mean of the differences (d) between the pretest and the post test values of experimental group is 20.4 and control group is 10.07.
- Calculated t value (3.62) is greater than thae table value (t=2.048) at 5% level of significance for two –tailed test, showing that there is significant difference between the two groups.So the null hypothesis is rejected.

3. Dependent t test

A. Comparing the initial and day 7 values of experimental group.

- Mean pretest value is 50.26 and post test value is 70.66.
- Calculated t value (9.04) is greater than the table value (t=2.145) at 5% level of significance for two- tailed test, showing that there is significant difference between the two values.

B. Comparing the initial and day 7 values of control group.

- Mean pretest value is 52.8 and post test value is 62.86.
- Calculated t value (5.73) is greater that the table value (t=2.145) at 5% level of

  significance ,showing that there is significant difference between the two values.

3. Percentage of difference

Percentage increase in patellofemoral joint funcitional scale rating from initial value in experimental group is 20.4% and control group is 10.06%.

When comparing the percentage difference in increase of patellofemoral funcitional scale rating between experimental and control group, there is better improvement in experimental group at the end of treatment.

DISCUSSION

The study is the randomized controlled trial to compare the effectiveness of taping technique with short wave diathermy and isometric quadriceps exercise in chronic patellofemoral arthritis of knee.

Analysis of the number of individual in age class interval between experimental and control group using Extended Chi-squared test reveals that there is overall differences in the group and that the grouping of subjects in experimental and control group is not significantly associated with the age class interval.

Analysis of the number of individuals in sex and side variations between experimental and control group usin Chi-squared test reveals that there is no significant difference in terms of sex and side allotment between both the groups. Analysis of the mean change in pain at knee had revealed a statistically significant difference at 5% level of significance in experimental group who received taping along with short wave diathermy,isometric quadriceps exercises and home exercises than the control group who received short wave diathermy, isometric quadriceps exercises and home exercise alone.

Analysis of the mean change in function at knee using Patellofemoral Joint Evaluation Scale had revealed a statistically significant difference at 5% level of significance in experimental group who received taping along with short wave diathermy,isometric quadriceps exercises and home exercises than thae control group who received short wave diathermy,isometric quadriceps exercises and home exercise alone.

Results obtained after analysis of pain in exeperimental group shows that there is 15.4% reduction in pain which is statistically significant in those patients who received taping technique when compared with control group at the end of day 7.Analysis of results regarding Patellofemoral Joint Evaluation Scale in experimental group shows a significant improvement of 20.4% at the end of day 7.

Results obtained after analysis of pain in control group shows 4.6% improvement at the end of day 7 using short wave diathermy and quadriceps exercise alone.

Analysis of results between pretest and posttest values of control group regarding Ptellofemoral Joint Evaluation Scale shows that there is

improvement of function of 10.6% at knee following short wave diathermy and quadriceps exercise on day 7.

Hence the post test statistical analysis of experimental group results compared withcontrol group results shows the superiority of taping technique along with short wave diathermy and quadeiceps exercise in patellofemoral arthritis for improving pain and funcition.This permits the rejection of null hypothesis.

The better results in the experimental group could be due to the effect of taping technique which provides reduction of pressure on lateral facet of the joint and thereby also prevent tracking of patella.Pain reduction is also due to the effect of short wave diathermy in increasing vasodialation,increasing rate of nerve conduction and elevation of pain threshold.The improvement in funcitional score is due to alteration of muscle strength, acceleration of enzymatic activity and
increased soft tissue extensibility due to isometric quadeiceps strengthening.

Knee osteoarthritis presents as a serious health care problem, the combination of its effect on patient and the therapeutic procedures used produce a huge burden on society. Simple , safe, physical treatment

procedures could be of great value and might be combined with other simple, non-invasive intervention such as taping in order to improve the patient condition. After minimal instruction patients are able to apply their own patellar tape.This provides them with a low cost easy means of treatment that is under their own control. Relief of symptoms might be maintained by concurrent exercises to strengthen the medial part of the quadriceps muscle to permanently realign the patella.

LIMITATIONS AND SUGGESTIONS

Limitations

- The study was conducted over a short period of time.
- Sample size taken for the study was small.
- Limited parameters of outcome measures were used.
- No follow- up was dione.
- All measurements were taken by the researcher himself,hence bias ca be expected.
- No blinding of procedures was done which could bias the measurement taken.
- All the measures were taken manually and this may introduce human error

which could affect the reliability of the study.

This study is oerformed over a relatively short period of 7 days and does not prove that taping is either safe oe effective in the long term.

Suggestions

- ✓ To make the results more valid a long term study may be carried out.

- ✓ To establish the efficacy of the treatment a large sample size study is required.

- ✓ The use of a different funcitional outcome measure could make tha study more valuable.

- ✓ A follow-up could ensure the long –term effectiveness of the treatment given.

- ✓ Blinding of the procedures could improve the reliability ot the outcome.

- ✓ Further trials to investigate taping in other patient groups,with longer periods of taping, and do test the relative costs and benefits of this and other interventions in knee osteoarthritis should be undertaken.

SUMMARY

This study was conducted to investigate the effect of medial taping technique and its possible application in quadriceps rehabilitation

particularly in patellofemoral arthritis. The standard treatment of patellofemoral arthritis includes short wave diathermy and static quadriceps exercise which is supported by previous studies and literatures.

In this study , 30 patients between the age group of 50-65 years, with a history of patellofemoral arthritis ranging in duration from 6 months to 2 years were taken. The sample consisted of 17 females and 13 males with all subjects having unilateral symptoms.The thirty subjects were divided in to two groups of 15 each and named experimental and control group. Both groups were treated with short wave diathermy and static quadriceps exercise. Experimental group was given medial taping techinique in addition. Duration of the treatment was 7 days for both the groups.The outcome measures taken were pain and patellofemoral joint evaluation scale which were recorded before and after the treatment. The pre and post test values were statistically tested using t test for their level of significance.

The result showed that the experimental group was better than the control group in reduction of pain and gaining improvement in funcitional ability.

CONCLUSION

The study reviewed a significant and consistent finding on the application of medial tape in the treatment of pain in patellofemoral arthritis leading to a reduction in pain symptoms and in improving function. Though the proof to support medial taping mechanism of pain reduction remains as elusive as the cause of patellofemoral pain itself, the positive effects of medial taping warrant the continued use of taping in the physiotherapy department.

While argument can be made that the mechanisms behind many treatmenttechniques are not known , it is important to recognize that the continued pursuit of supporting evidence is a paramount. Further research serves to clear the debate over such interventions and also may lead the researcher to even more effective methods of treatment, through a better understanding of its effects.

The clinical significance of pain reduction also impacts the exercise area, as it has an inhibitory effect on the quality of muscle contraction, and is known to be a leading factor in the limitation of function. Patellar taping decreases patellofemoral pain, thus allowing for increased funcitional motion.

Patella taping is a simple, safe, cheap method of providing short-term pain relief in patients with osteoarthritis of the patellofemoral joint.

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APPENDIX-1

ASSESMENT FORM

Name: **Age:** **Date:**

Address: **Sex:**

Occupation/Position:

Date of onset: **Spontaneous/General**

Complaints :

Past History :

Previous surgery (if any) :

Symptoms :

Day 1 **Day 7**

Pain :

- **VAS rating**
- **Location**
- **Type**
- **Severity**
- **Activity related**
- **Post- activity**

Swelling :

Symptoms associated with any ADL :

- **Sitting**
- **Squating**
- **Arising**
- **Kneeling**

Range of Motion

- **Active**

  Flexion :

  Extension :

- **Passive**

  Flexion :

  Extension :

Muscle Testing

- **Quadriceps**
- **Hamstring**

Instability test :

- **Drawer's test :**
- **Mc . Murray test :**
- **Lachman's test :**
- **Medial – Lateral Instability**

Test :

Extensor lag ; (Y/N)

Funcitional assessment :

- **Patellofemoral Joint evaluation Scale.**

APPENDIX - II

PATELLOFEMORAL JOINT EVALUATION SCALE

	Points
LIMP	
None	**5**
Slight or episode	**3**
Severe	**0**
ASSISTIVE DEVICES	
None	**5**
Cane or brace	**3**
Unable to bear weight	**0**
STAIR CLIMBING	
No problem	**20**
Slight impairment	**15**
Very slowly	**10**
One step at a time , always same leg first	**5**
Unable	**0**

CREPITATION

None	**5**
Annoying	**3**
Limits activities	**2**
Severe	**0**
	points

INSTABILITY , " GIVING WAY"

Never	**20**
Occasionally with vigorous activities	**10**
Frequently with vigorous activities	**8**
Occasionally with daily activities	**2**
Every day	**0**

SWELLING

Never	**10**
After vigorous activities only	**5**
After walking or mild activities	**2**
Constant	**0**

PAIN

None	**35**

Occasionally with vigorous activities **30**

Marked with vigorous activities **20**

Marked after walking 1 mile or mild **1**

Moderate rest pain

Marked with walking <1 mile **10**

Constant and severe **0**

- **Funcitional results were assessed according to the patellofemoral scoring scale.**

Excellent results equal 90-100 points , good 80-89 , fair 60-79 ,and poor <60 points.

APPENDIX -III

HOME EXERCISES

APPENDIX- IV

I ……. voluntarily consent to participate in the

research study named " The effect of medial taping of patella in chronic primary

osteoarthritis of the knee with patellofemoral involvement ".

The researcher has explained the treatment approach and the risk of

participation and has answered my questions related to the research to my

satisfaction.

Participant's signature:

Signature of Witness :

Signature of researcher :